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U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE  
**WATER SUPPLY OUTLOOK  
FOR  
MONTANA**

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS  
Collaborating with

MONTANA AGRICULTURAL EXPERIMENT STATION

AS OF  
MAY 1, 1978

UNITED STATES DEPARTMENT OF AGRICULTURE  
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## Montana Water Supply Outlook

### MOUNTAIN SNOWPACK

THE HIGH ELEVATION SNOWPACK IS NEAR AVERAGE IN MOST AREAS. LOWER ELEVATIONS HAVE BELOW AVERAGE WATER CONTENT. THE LACK OF LOW ELEVATION SNOW WILL NOT ADVERSELY AFFECT THE WATER SUPPLY. EARLY SEASON RUNOFF WILL BE A LITTLE LESS THAN NORMAL, BUT THE GOOD HIGH ELEVATION SNOW WILL HOLD STREAMFLOWS UP LATER IN THE SUMMER.

THE WARM TEMPERATURES THAT STARTED THE SNOW MELTING NEAR THE END OF MARCH HAVE CONTINUED. TEMPERATURES HAVE NOT BEEN ABNORMALLY WARM AND MOST OF THE MELT HAS BEEN QUITE GRADUAL AND UNIFORM THROUGHOUT THE MONTH. TEMPERATURES IN THE HIGHER ELEVATIONS HAVE REMAINED COOL. ALTERNATING PERIODS OF WARM WEATHER AND SNOWFALL HAVE ALLOWED SNOW WATER CONTENT LEVELS IN THE

HIGHER AREAS TO REMAIN ABOUT THE SAME AS THEY WERE AT THE BEGINNING OF APRIL.

WEST OF THE DIVIDE, THE FLATHEAD AND BITTERROOT RIVERS HAVE NEAR AVERAGE SNOWPACK WHILE THE REMAINDER OF THE DRAINAGES HAVE BELOW AVERAGE SNOW.

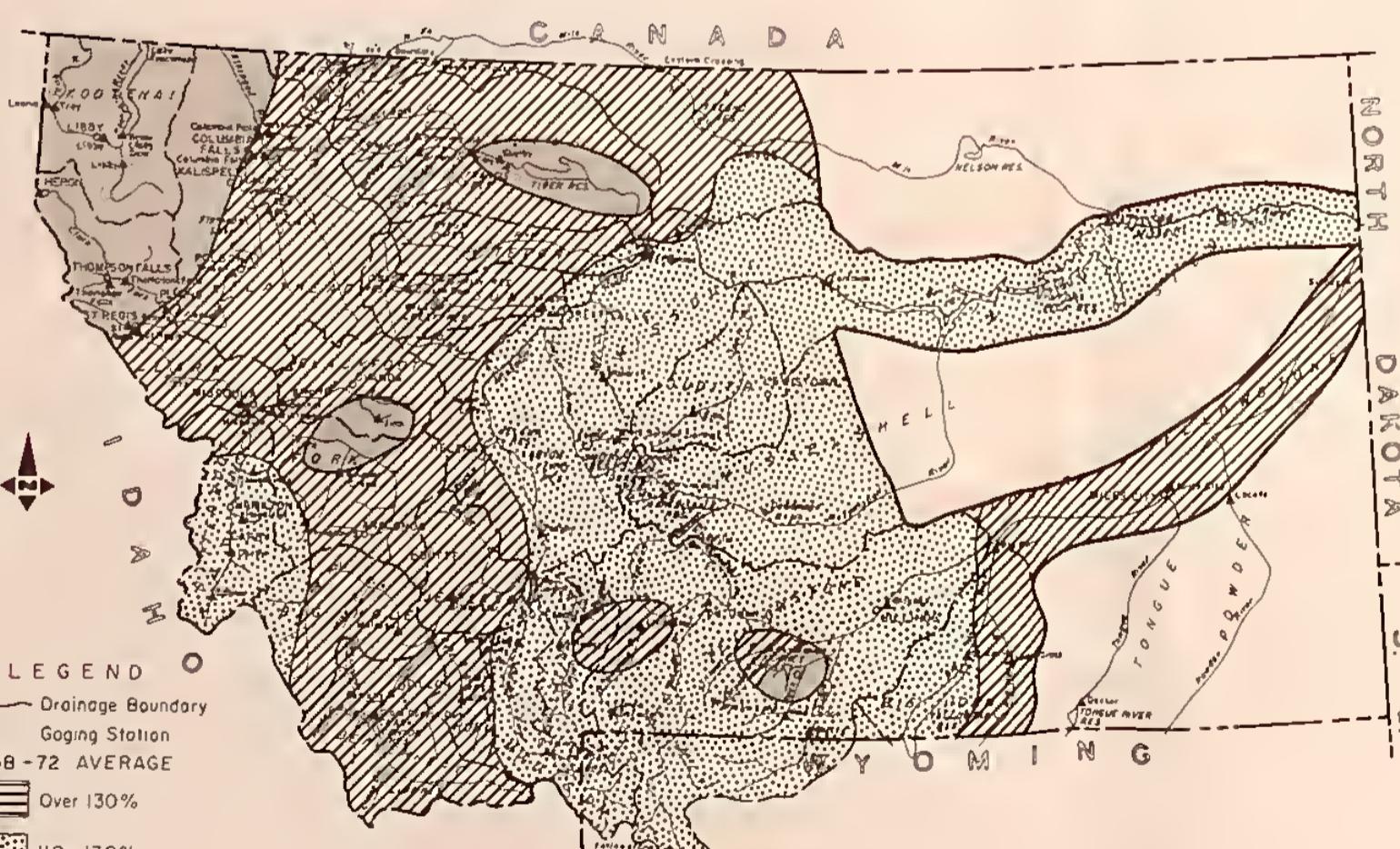
EAST OF THE DIVIDE, ABOVE AVERAGE SNOW WATER CONTENT WAS MEASURED IN PARTS OF THE RED LODGE, BIG HOLE, MADISON, GALLATIN AND YELLOWSTONE RIVER HEADWATERS AND IN THE BEAR PAW, BIG BELT, LITTLE BELT AND CASTLE MOUNTAINS.

THE SMALL AREA ON THE FRONT FACE OF THE BEARTOOTH MOUNTAINS NEAR RED LODGE CONTINUES TO SHOW WELL BELOW AVERAGE SNOW.

OTHER AREAS IN THE YELLOWSTONE AND MISSOURI RIVER DRAINAGES HAVE NEAR AVERAGE SNOWPACK IN THE MAIN WATER PRODUCING ZONES.



### STREAMFLOW FORECASTS



### MONTANA PROSPECTIVE STREAMFLOW FORECASTS

50 0 50 100  
SCALE IN MILES  
Soil Conservation Service  
Bozeman, Montana

MAY THROUGH SEPTEMBER RUNOFF IS FORECAST TO BE BELOW AVERAGE IN EXTREME NORTHWESTERN MONTANA AND IN SMALLER AREAS NEAR DRUMMOND, SHELBY AND RED LODGE.

ABOVE AVERAGE RUNOFF IS EXPECTED IN THE BITTERROOT RIVER DRAINAGE, AND MOST STREAMS AND RIVERS SOUTH AND WEST OF THE MISSOURI RIVER AND THE MADISON AND GALLATIN RIVER DRAINAGES IN THE MISSOURI RIVER HEADWATERS.

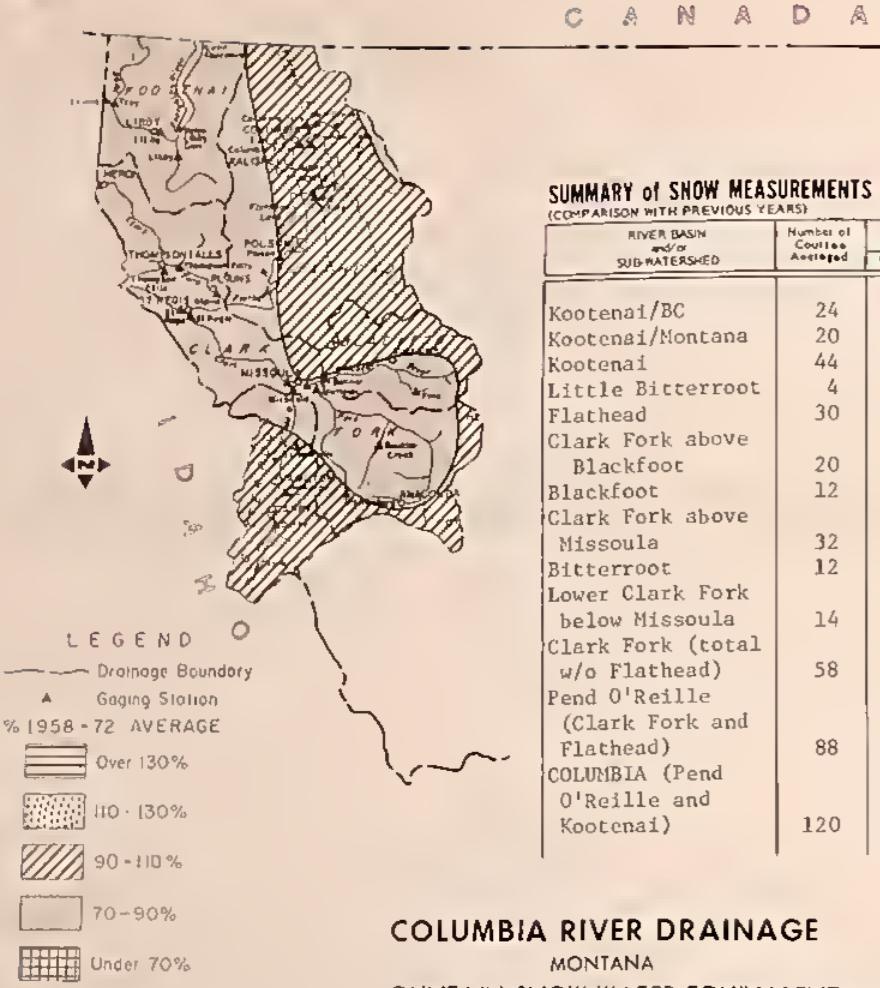
RUNOFF IN APRIL WAS GENERALLY A LITTLE ABOVE AVERAGE IN MOST DRAINAGES. THE GRADUAL MELTING OF LOW ELEVATION SNOW HAS HELPED REDUCE THE POTENTIAL FOR EXTREMELY HIGH WATER RESULTING FROM RAPID SNOW MELT.

MOST STREAMS ARE EXPECTED TO HAVE ABOUT AVERAGE STREAM LEVELS DURING THE MAIN SNOW MELT PERIOD UNLESS HEAVY RAINS COINCIDE WITH THE MAIN MELT PERIOD. IT APPEARS THAT THE MAIN SNOW MELT RUNOFF WILL OCCUR ON MOST MAJOR RIVERS AFTER MID-MAY.

WITH THE NEAR OR ABOVE AVERAGE, HIGH ELEVATION SNOW AND GOOD SOIL MOISTURE IN MOST AREAS, THE IRRIGATION WATER SUPPLIES ARE EXPECTED TO BE AVERAGE OR ABOVE IN MOST AREAS.

# Columbia River Drainage

## MOUNTAIN SNOWPACK



KOOTENAI - CONSIDERABLE MELT IN LOWER ELEVATIONS DURING APRIL. HIGH ELEVATIONS ARE ABOUT THE SAME AS A MONTH AGO. ALL AREAS ARE GENERALLY BELOW AVERAGE IN SNOWPACK.

FLATHEAD - HIGH ELEVATIONS ARE NEAR OR ABOVE AVERAGE WITH SOME INCREASES IN WATER CONTENT DURING THE MONTH. DRAINAGES WEST OF KALISPELL AND GLACIER NATIONAL PARK AND LOWER ELEVATIONS GENERALLY HAVE BELOW AVERAGE SNOWPACK.

BLACKFOOT - MOST DRAINAGES HAVE AVERAGE OR ABOVE SNOWPACK FOR THIS TIME OF YEAR. LOWER ELEVATIONS GENERALLY HAVE BELOW AVERAGE SNOW AS A RESULT OF MELT DURING APRIL.

LOWER CLARK FORK - GENERALLY BELOW AVERAGE IN ALL AREAS. THE SNOWPACK IS NEAR TO AVERAGE IN HIGHER ELEVATIONS. LOWER ELEVATIONS SHOW CONSIDERABLE MELT DURING APRIL.

## MOUNTAIN SOIL MOISTURE

MANY LOWER ELEVATION SOILS ARE DRYING SOMEWHAT ON THE SURFACE BETWEEN SHOWERS. IN GENERAL SOIL MOISTURE IS GOOD.

## VALLEY PRECIPITATION

REPORTS FROM THE NATIONAL WEATHER SERVICE INDICATE THAT VALLEY PRECIPITATION WAS GENERALLY ABOVE NORMAL FOR APRIL.

## IRRIGATION WATER SUPPLIES

MOST STREAMS PROVIDING IRRIGATION WATER ARE EXPECTED TO HAVE ABOUT AVERAGE LATE SEASON FLOWS. SOME STREAMS WITH HIGH ELEVATION HEADWATERS WILL HAVE ABOVE AVERAGE FLOWS.

## COLUMBIA RIVER DRAINAGE MONTANA

### MOUNTAIN SNOW WATER EQUIVALENT

## STREAMFLOW FORECASTS

### SPRING RUNOFF

STREAMFLOWS DURING THE MAIN SNOWMELT PERIOD ARE EXPECTED TO BE AROUND NORMAL LEVELS. THE MELTING OF LOWER ELEVATION SNOW HAS REDUCED THE POTENTIAL FOR HIGH FLOWS FROM SNOWMELT ALONE. ALL STREAMS SHOULD BE ABLE TO CARRY THE SNOWMELT RUNOFF WITHIN THEIR CHANNELS.

**KOOTENAI** - MAY THROUGH SEPTEMBER RUNOFF IS FORECAST AT 10 TO 20 PERCENT BELOW AVERAGE. RUNOFF FOR APRIL WAS ABOUT AVERAGE. **FLATHEAD** - FORECASTED RUNOFF IS A LITTLE BELOW AVERAGE FOR THE MAIN SNOWMELT PERIOD FOR THE SOUTH AND MIDDLE FORKS. BELOW AVERAGE RUNOFF IS EXPECTED FROM STREAMS WITH HEADWATERS IN THE SALISH MOUNTAINS AND NORTH FORK. APRIL RUNOFF WAS ABOVE AVERAGE.

**BLACKFOOT** - SEASONAL RUNOFF IS ABOUT 10 PERCENT BELOW AVERAGE. LATE SEASON STREAMFLOW IS EXPECTED TO BE ABOUT AVERAGE. RUNOFF DURING APRIL WAS A LITTLE ABOVE AVERAGE.

**UPPER CLARK FORK** - AVERAGE OR A LITTLE BELOW AVERAGE RUNOFF IS FORECAST FOR MOST STREAMS.

STREAMS WITH LOWER ELEVATION HEADWATERS WILL PRODUCE BELOW AVERAGE RUNOFF. RUNOFF IN APRIL WAS A LITTLE ABOVE AVERAGE.

**LOWER CLARK FORK** - SMALLER STREAMS FLOWING INTO THE CLARK FORK WILL HAVE BELOW AVERAGE RUNOFF. THE FLOW IN THE CLARK FORK WILL BE A LITTLE BELOW AVERAGE FOR THE SEASON. STREAMFLOW IN APRIL WAS A LITTLE ABOVE AVERAGE.

STREAM OR AREA	Estimated at Poor, Fair, Average, Excellent Runoff and Water Supply	
	Spring Season	Late Season
Tobacco	avg	fair
Little Bitterroot	avg	fair
Mission Valley	avg	avg
Flint Creek	avg	avg
Upper Clark Fork	avg	avg
Nevada Creek	avg	avg
Blackfoot	avg	avg
West-side Bitterroot	ex	avg
East-side Bitterroot	ex	avg
Bitterroot River	ex	avg
Lower Clark Fork	avg	avg

**CLARK FORK RIVER** above Missoula

**CLARK FORK RIVER** above Milltown (7)

**CLARK FORK RIVER** above Missoula

**WEST BITTERROOT RIVER** near Conner (7)

**BITTERROOT RIVER** near Darby

**SKALHO CREEK** near Hamilton

**BURNT FORK CREEK** near Stevensville (8)

**BITTERROOT RIVER** at Missoula (9)

**CLARK FORK RIVER** below Missoula

**CLARK FORK RIVER** at St. Regis (NWS)

**NORTH FORK FLATHEAD RIVER** near Columbia Falls

**MIDDLE FORK FLATHEAD RIVER** near West Glacier

**SOUTH FORK FLATHEAD RIVER** near Columbia Falls

**FLATHEAD RIVER** at Columbia Falls (10)

**SWAN RIVER** near Big Fork

**FLATHEAD RIVER** near Polson (11)

**CLARK FORK RIVER** near Plains (11) (NWS)

**THOMPSON RIVER** near Thompson Falls

**PROSPECT CREEK** at Thompson Falls

**CLARK FORK RIVER** at Whitehorse Rapids (12) (NWS)

1) Adjusted for storage in Lake Koocanusa.

2) Adjusted for storage in Silver Lake, diversions to and pumping from Georgetown Lake.

3) Adjusted for storage in Georgetown Lake, diversions from and pumping to Silver Lake.

4) Sum Flint Creek at Maxville and Boulder Creek at Maxville.

5) Sum of North Fork Lower Willow Creek near Hall and South Fork Lower Willow Creek near Hall.

6) Difference in observed flow Clark Fork above Missoula and Blackfoot near Bonner.

(7) Adjusted for storage in Painted Rocks Reservoir

(8) Adjusted for diversion into Sunset Highline Canal.

(9) Difference in observed flow Clark Fork above and below Missoula.

(10) Adjusted for storage in Hungry Horse Reservoir.

(11) Adjusted for storage in Hungry Horse Reservoir and Flathead Lake.

(12) Adjusted for storage in Hungry Horse Reservoir, Flathead Lake and Noxon Rapids Reservoir.

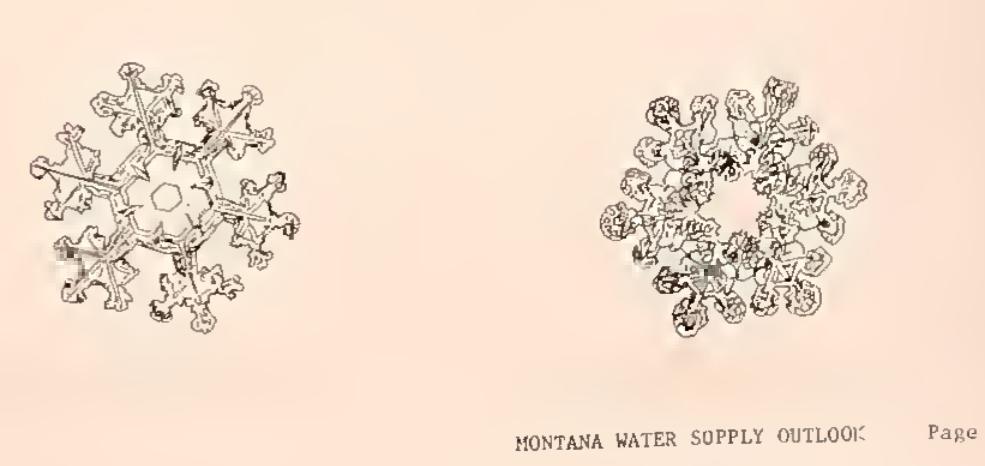
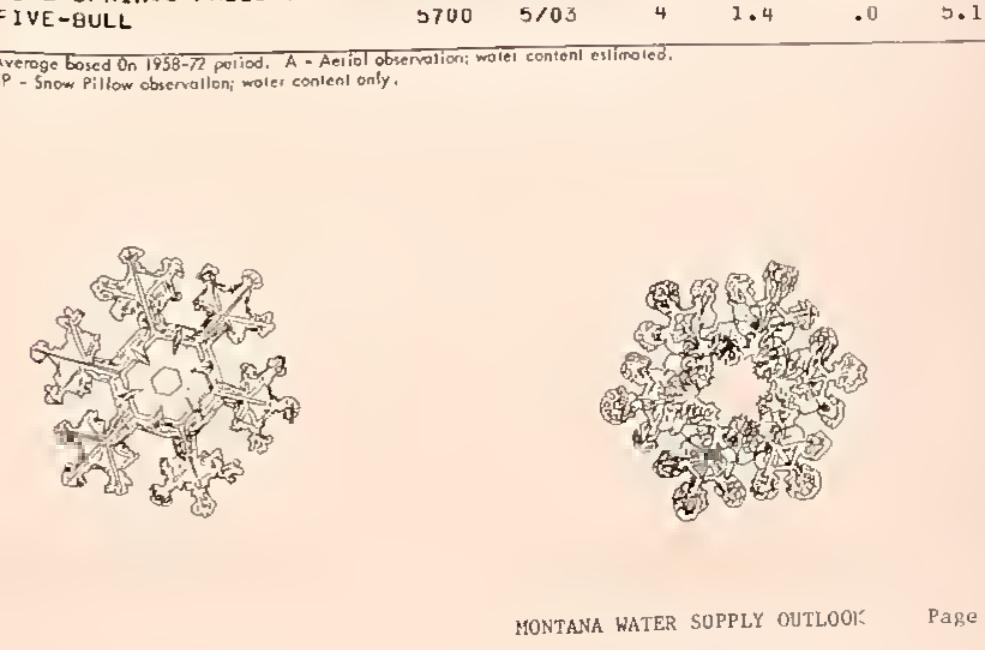
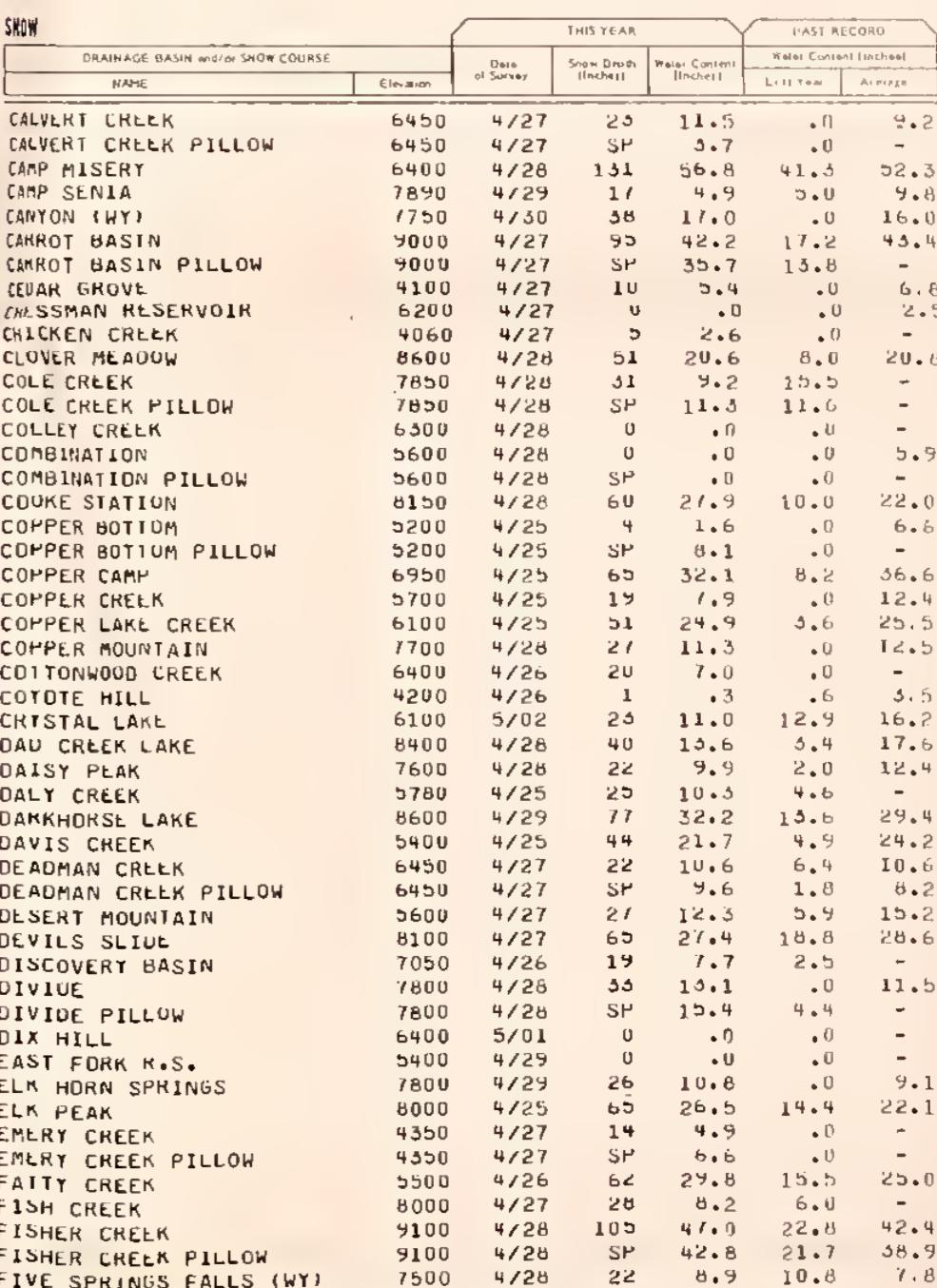
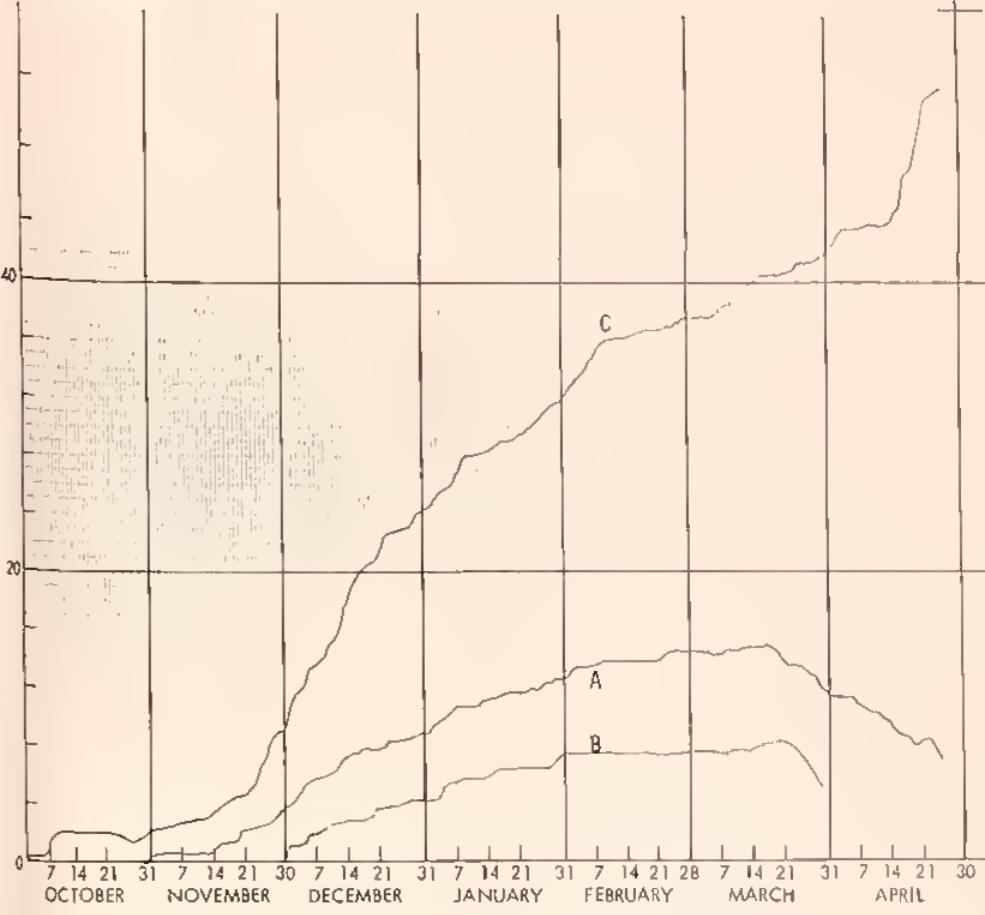
(NWS) National Weather Service.

Average based on 1958-72 period.

## SNOW SURVEYS

### FLATHEAD RIVER

A Emery Creek - elevation 4,350 ft., in Emery Creek drainage northeast of Kalispell.  
 B Meadow Creek - elevation 4,000 ft., in South Fork Flathead River drainage southwest of Hungry Horse. Data from Bonneville Power Admin.  
 C Noisy Basin - elevation 6,040 ft., in Noisy Creek drainage east of Kalispell.

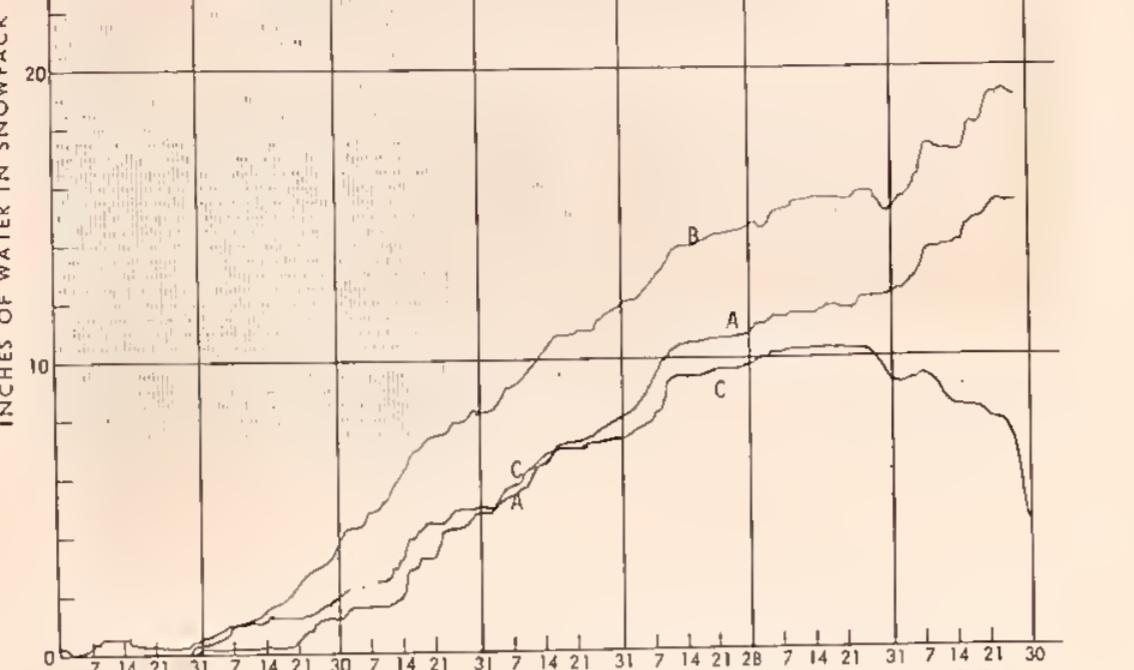




# SNOW SURVEYS

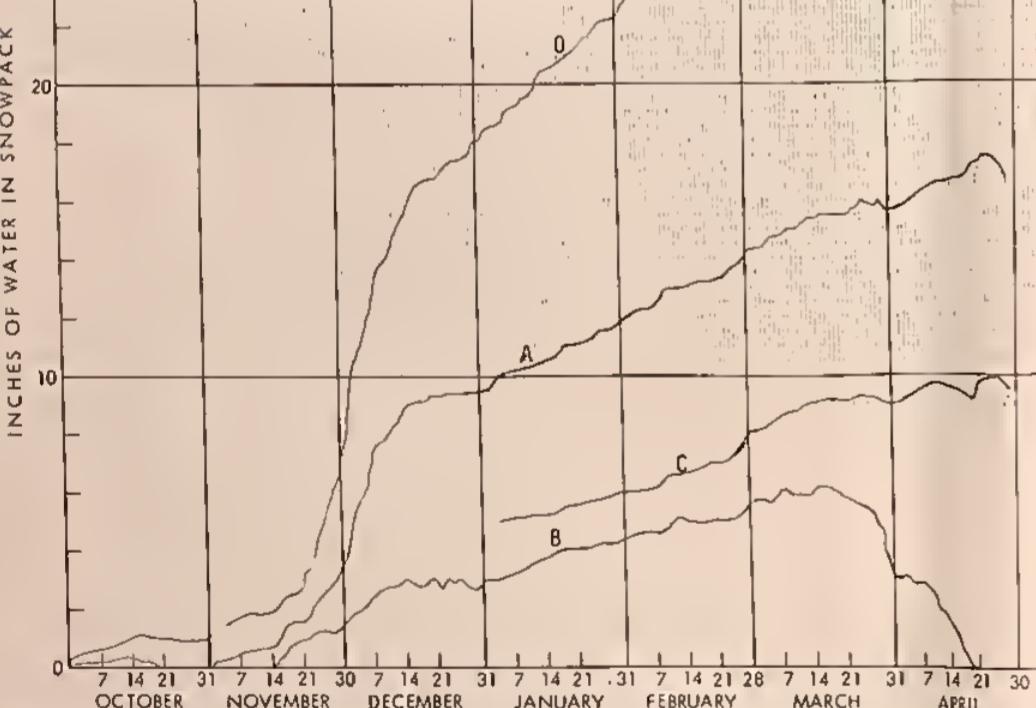
## RUBY-MADISON RIVERS

NAME	Elevation	THIS YEAR			PAST RECORD		
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average	
FLEECE RIDGE	7500	4/28	22	9.4	.4	-	
FOULMEN	8280	4/29	44	19.1	7.4	19.9	
FOUR MILE	6900	4/28	7	2.4	.3	8.8	
FOURTH OF JULY	5450	4/27	14	5.0	.0	-	
FROLI BURN PASS	8000	4/28	69	28.6	11.8	32.6	
FREIGHT CREEK	6000	5/03	30	15.5	.0	15.9	
FRIDAY HILL	4620	4/27	26	15.0	.0	-	
FROMMER MEADOWS	6480	4/24	10	5.8	.0	-	
FROMMER MEADOWS PILLOW	6480	4/24	SM	8.4	.0	-	
GARVER CREEK	4250	4/25	14	6.4	.0	5.4	
GARVER CREEK PILLOW	4250	5/01	SM	5.4	.7	5.1	
GIBBONS PASS	7100	4/26	47	25.4	4.5	24.2	
GOAT MOUNTAIN	7000	4/28	29	10.9	.1	10.9	
GOLO STONE	8100	4/27	49	20.7	6.9	19.4	
GRASSHOPPER	7000	4/25	13	5.4	1.4	5.9	
GRAVE CREEK	4300	4/24	39	15.9	3.8	16.3	
GRAVE CREEK PILLOW	4300	4/24	SM	14.1	.0	-	
GRIFFIN CREEK DIVIDE	5150	4/25	17	1.6	.0	8.6	
GRIZZLY PEAK	8400	4/28	31	12.1	16.0	21.1	
GUNSLIGHT LAKE	6500	5/03	78	45.8	21.6	45.4	
HALVERSON CREEK (10)	4850	4/26	85	40.2	18.0	49.7	
HAND CREEK	5050	4/26	25	10.7	.0	-	
HAND CREEK PILLOW	5050	4/26	SM	10.9	.0	-	
HAWKINS LAKE	6450	4/25	70	30.9	13.1	35.4	
HAWKINS LAKE PILLOW	6450	5/03	SM	25.3	12.0	33.2	
HEART LAKE TRAIL	4800	4/22	52	15.3	5.3	19.0	
HEBGEN DAM	6550	4/27	23	11.7	.6	6.6	
HELL ROARING DIVIDE	5770	4/25	72	32.2	12.6	34.3	
HENRIG JUNCTION	4650	4/27	45	25.4	9.0	-	
HIGHWOOD DIVIDE	5650	4/26	0	0.0	-	-	
HIGHWOOD STATION	4600	4/28	0	0.0	-	-	
HOLBROOK	4550	4/26	3	1.1	.4	1.9	
HOD MEADOW	6600	4/27	18	7.8	6.4	11.6	
HOODOO BASIN	6000	4/27	104	52.4	20.6	55.2	
HOODOO BASIN PILLOW	6000	4/27	SM	48.3	13.6	55.5	
HOODOO CREEK	5990	4/27	95	45.4	18.4	52.2	
ICELING LAKE #3	5600	5/03	47	22.3	12.9	35.5	
INDEPENDENCE	7850	5/01	36	17.2	4.0	19.8	
INKEGAARD	6450	4/27	0	0.0	0.0	-	
ISLAND PARK (10)	6310	4/28	23	12.5	0.0	10.2	
JAHNKE LAKE TRAIL	7200	4/27	20	8.7	.4	8.3	
JOHNSON PARK	6450	4/28	2	.5	0.0	3.5	
JOSEPHINE LOWER #9	4900	5/02	21	11.6	4.4	18.9	



## CLARK FORK-BITTERROOT RIVERS

A Black Pine - elevation 7,100 ft., in Lower Willow Creek drainage near Black Pine Lookout northwest of Philipsburg.  
 B Combination - elevation 5,600 ft., in Lower Willow Creek drainage northwest of Philipsburg.  
 C Peterson Meadows - elevation 7,200 ft., in Flint Creek drainage south of Georgetown Lake. USFS-SCS cooperative site.  
 D Skalkaho Summit - elevation 7,250 ft., on Bitterroot-Rock Creek divide near Skalkaho Pass south of Philipsburg and west of Hamilton.



## AGENCIES AND ORGANIZATIONS COOPERATING IN MONTANA SNOW SURVEYS

### GOVERNMENT AGENCIES

**Canada**  
 Water Survey of Canada, Calgary, Department of the Environment  
 Water Resources Service, Department of Lands, Forests and Water Resources, British Columbia  
 Alberta Environment, Edmonton, Alberta

**Federal**  
 Department of the Army - Corps of Engineers  
 Department of Agriculture - Forest Service  
 - Soil Conservation Service  
 - NOAA

Department of Commerce  
 - National Weather Service  
 - Bonneville Power Administration  
 - Bureau of Indian Affairs  
 - Bureau of Reclamation  
 - Fish and Wildlife Service  
 - Geological Survey  
 - National Park Service

### STATE AGENCIES

Montana Conservation Districts  
 Montana Department of Fish and Game  
 Montana Department of Natural Resources and Conservation  
 Montana State University - Agricultural Experiment Station  
 University of Montana - School of Forestry  
 DNRC - State Forester

### PRIVATE ORGANIZATIONS

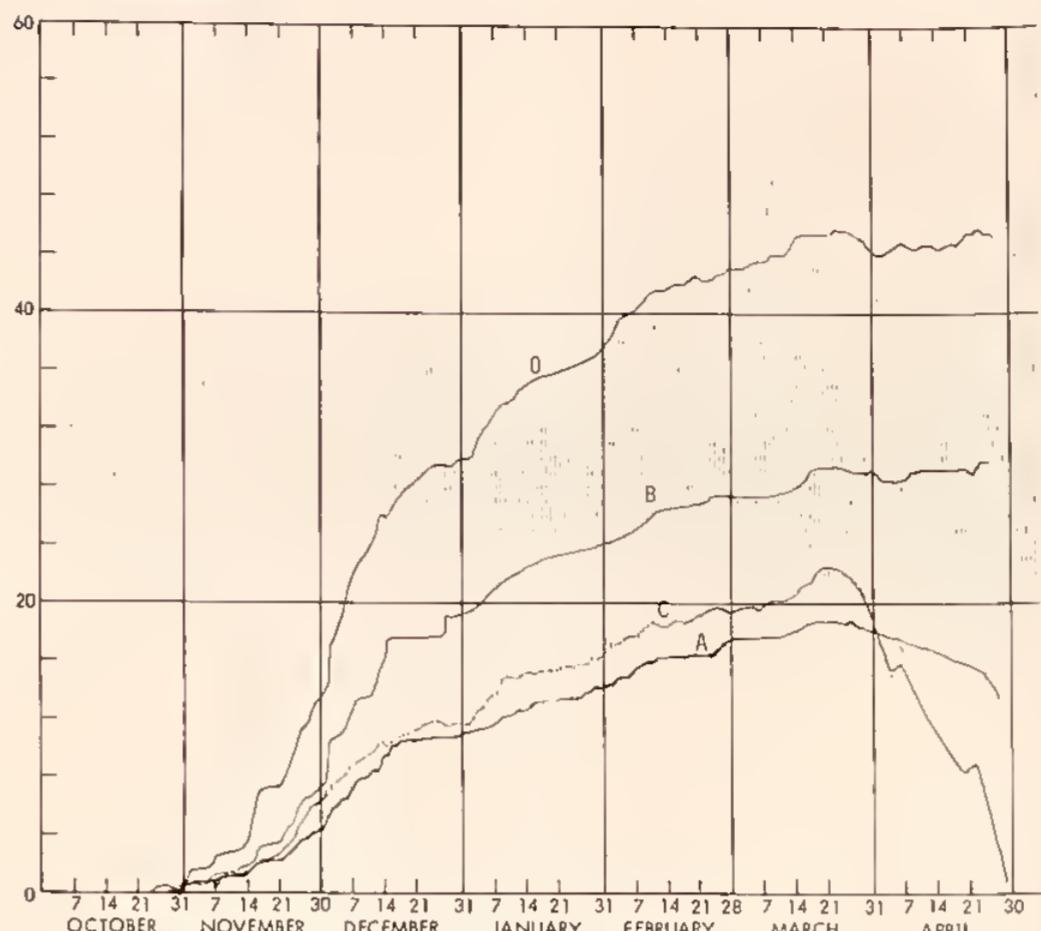
Montana Power Company  
 Butte Water Company  
 The Anaconda Company

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

# SNOW SURVEYS

## BITTERROOT-BIG HOLE RIVERS

A Nez Perce Camp - elevation 5,650 ft., in West Fork Bitterroot River drainage near Nez Perce Pass southwest of Darby.  
 B Saddle Mountain - elevation 7,900 ft., in East Fork Bitterroot River drainage near Lost Trail Pass southeast of Darby and west of Wisdom.  
 C Twelvemile Creek - elevation 5,600 ft., in Lost Horse Creek drainage southwest of Hamilton.  
 D Twin Lakes - elevation 6,400 ft., in Lost Horse Creek drainage southwest of Hamilton.



### SNOW

NAME	Elevation	THIS YEAR			PAST RECORD		
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average	
SALJAKA	6550	4/26	43	21.6	9.2	14.3	
SAUOLE MOUNTAIN	7940	4/26	62	31.4	10.2	26.0	
SAUOLE MOUNTAIN PILLOW	7940	4/26	SP	30.6	10.8	30.2	
SANTELL MOUNTAIN (10)	8710	4/26	98	46.2	5.5	56.1	
SENTINEL CREEK	6500	5/02	67	32.4	8.0	26.1	
SHOWER FALLS	8100	4/27	71	50.7	20.5	26.7	
SILVER RUN PILLOW	8100	4/27	SP	29.8	14.0	32.2	
SILVER RUN PILLOW	6650	4/28	0	0.0	2.7	-	
SKALKAHO SUMMIT	7260	4/29	58	26.8	9.4	28.0	
SKALKAHO SUMMIT PILLOW	7260	4/29	SP	29.7	5.4	-	
SLAG-A-MELI LAKE	8750	4/29	68	51.0	10.2	29.1	
SLIDE ROCK MOUNTAIN	7100	4/27	40	17.6	7.8	20.0	
SMUGGLER MINE	6960	5/01	22	10.0	0.0	11.6	
SOUTH FORK SHIELLOS	8100	4/28	72	32.3	23.2	30.0	
SPUR PARK	7000	5/03	15	6.5	0.0	11.8	
SPUR PARK PILLOW	8000	4/27	66	29.2	18.0	26.0	
SIAM PEAK	6150	4/24	11	49.4	23.2	44.3	
SIAM PEAK PILLOW	6050	4/24	SP	42.0	17.4	-	
STEAMBOAT POINT (WY)	7500	5/02	19	7.9	14.5	11.6	

Average based on 1958-72 period. A - Aerial observation; water content estimated.  
 SP - Snow Pillow observation; water content only.

## SUN, TETON, MARIAS, AND FLATHEAD RIVERS

A Mount Lockhart - elevation 6,400 ft., in Teton River drainage west of Choteau.  
 B Pike Creek - elevation 5,930 ft., near the Middle Fork Flathead-Two Medicine River divide south of Marias Pass between East Glacier and West Glacier.  
 C Waldron - elevation 5,600 ft., in Teton River drainage west of Choteau.



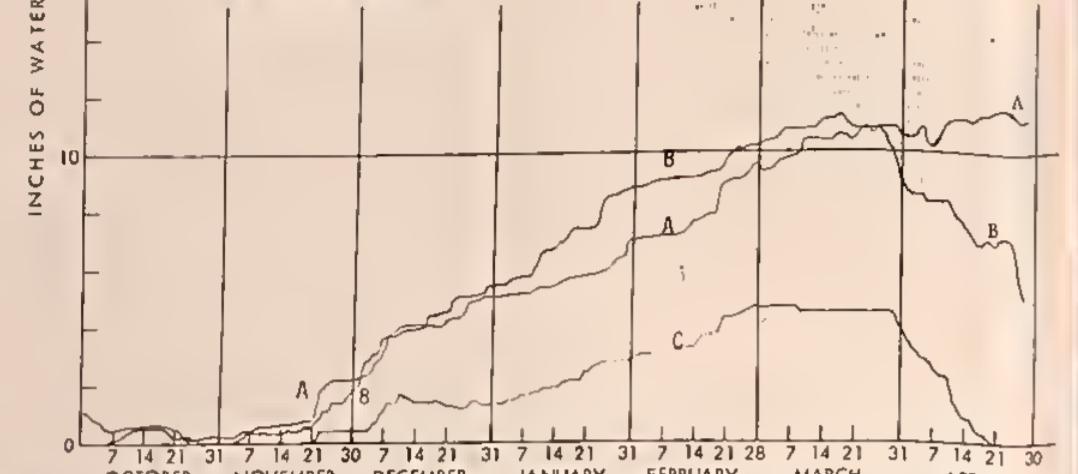
NAME	Elevation	THIS YEAR			PAST RECORD		
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year	Average	
NORTH FORK JOCKO							



# SNOW SURVEYS

## YELLOWSTONE RIVER

A Cole Creek - elevation 7,850 ft., at Red Lodge Mountain Ski Area northwest of Red Lodge.  
 B Porcupine - elevation 6,500 ft., in Shields River drainage near Porcupine Guard Station northeast of Wilsall.  
 C Silver Run - elevation 6,630 ft., in the West Fork of Rock Creek drainage southwest of Red Lodge.



Drainage Basin and/or Snow Course Name	Elevation	THIS YEAR			PAST RECORD		
		Date Surveyed	Snow Depth (inches)	Water Content (inches)	Water Content (inches)	Last Year	Average
STEMPL PASS	6600	4/27	30	12.5	1.4	11.9	
STORM LAKE	7780	4/27	36	19.7	5.1	17.4	
STYKER BASIN	6180	4/27	84	34.8	20.2		
STUART MILL	6500	4/27	0	0.0	0.0	6.7	
STUART MOUNTAIN	7400	5/02	72	37.2	6.8	35.0	
SULKER CREEK	3960	5/01	0	0.0	0.0	35.0	
SUGARLOAF	7350	4/25	14	4.8	0.0		
SYLVAN PASS (WY)	7100	5/01	22	11.0	0.0	11.1	
TAMCHEL PASS (10)	7000	4/28	36	17.8	0.0	15.4	
TAYLOR ROAD	4080	4/28	0	0.0	0.0		
TEN MILE LOWER	6600	4/27	4	1.5	0.0	6.0	
TEN MILE MIDDLE	6800	4/27	32	13.2	1.4	13.8	
TEN MILE UPPER	8000	4/27	39	16.8	3.2	17.1	
TEPEL CREEK	8000	4/28	59	22.6	5.0	18.0	
TIMBURLINE CREEK	8850	4/29	41	11.8	12.0	19.8	
TRAIL CREEK	7090	4/28	18	7.0	0.0		
TRUNKS LAKE	6100	5/03	83	45.1	21.2	49.4	
TV MOUNTAIN	6800	5/02	42	20.3	3.4	21.9	
TWELVEMILE CREEK	5600	4/28	26	12.5	2.4	15.6	
TWELVEMILE CREEK PILLOW	5600	4/28	SP	9.4	.1	14.5	
TWENTY-ONE MILE	7150	4/30	32	15.7	1.2	17.6	
TWIN CREEKS	5580	5/03	0	0.0	1.8		
TWIN LAKES	6510	4/28	95	48.2	20.9	46.6	
TWIN LAKES PILLOW	6400	4/28	SP	45.1	17.1	44.6	
UPPER HOLLOW LAKE	6200	5/03	74	46.0	15.2	41.1	
VALLY VIEW (10)	6500	4/28	20	11.6	0	14.2	
WALDRON	5600	5/01	12	5.6	0.0	7.5	
WALDRON PILLOW	5600	5/01	SP	5.7	0	10.2	
WARM SPRINGS	8250	5/01	50	23.0	0		
WARM SPRINGS PILLOW	8250	5/01	0	30.3	0		
WLAEL DIVIDE	5450	4/24	79	35.8	15.7	37.2	
WEST YELLOWSTONE	6700	4/29	18	8.2	0	7.2	
WEST YELLOWSTONE PILLOW	6700	5/01	SP	5.4	0	6.5	
WHISKEY CREEK	6800	4/25	48	25.3	0.0	20.3	
WHISKEY CREEK PILLOW	6800	4/25	SP	20.8	.5		
WHITE ELEPHANT (10)	7700	4/28	66	35.2	0.0		
WHITE MILL	8700	4/28	86	37.1	14.4	30.0	
WHITE MILL PILLOW	8700	4/28	SP	35.2	11.5	-	
WHITE PINE RIDGE	8850	4/28	7	2.3	0	5.0	
WILLOW CREEK	6500	4/28	0	0.0	.5	-	
WOLVERINE (WY)	7650	4/30	25	10.4	0	-	
WRONG CREEK	5700	4/25	22	10.6	0	11.9	
WRONG RIDGE	6800	4/26	48	22.3	7.4	22.2	

## LATE ARRIVING DATA

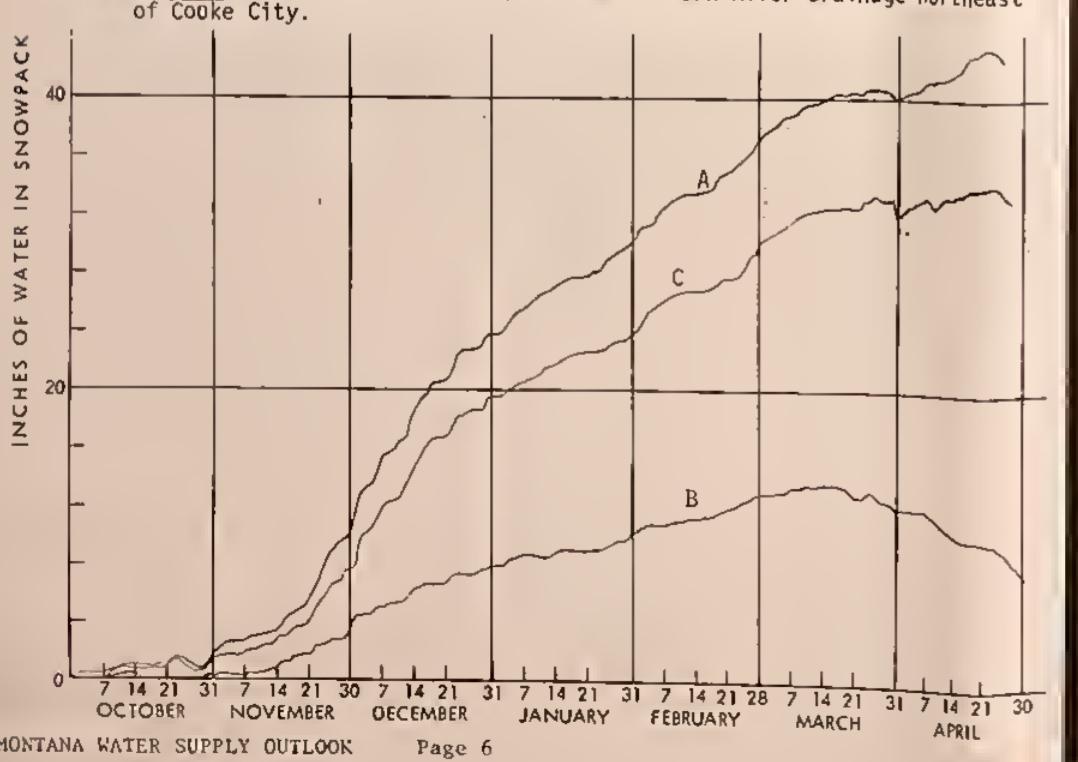
Drainage Basin and/or Station		Profile (inches)	Date of Survey	Soil Moisture (inches)		
Name	Elevation	Depth	Capacity	This Year	Last Year	Average
East Boulder S	9250	5/04	87	37.5A	20.5	-
Picket Pin D	9450	5/04	63	25.0A	9.5	-
Placer Basin F	8800	5/04	51	20.5A	11.0	-
Star Lake E	9650	5/04	111	50.0A	27.0	-

Average based on 1958-72 period. A - Aerial observation; water content estimated.

SP - Snow Pillow observation; water content only.

## YELLOWSTONE RIVER

A Fisher Creek - elevation 9,100 ft., in Clark's Fork River drainage northeast of Cooke City.  
 B Northeast Entrance - elevation 7,3500 ft., at the Northeast Entrance to Yellowstone National Park, west of Cooke City.  
 C White Mill - elevation B,700 ft., in Clark's Fork River drainage northeast of Cooke City.



Average for period of record.

## RESERVOIR STORAGE (Thousand Acre Feet)

END OF MONTH

Stream or Stream		Usable Capacity		Usable Storage
		THIS YEAR	LAST YEAR	AVERAGE
Kootenai	Koocanusa	5,694.0	1,865.0	2,291.0
Flathead	Hungry Horse	3,428.0	1,947.0	2,267.0
	Flathead Lake	1,791.0	835.3	977.9
Clark Fork	Camas (4)	45.2	15.3	32.5
	Mission Valley (8)	100.3	70.6	44.0
	Georgetown Lake	31.0	24.6	23.1
	Lower Willow Creek	4.9	4.0	2.4
Bitterroot	Nevada Creek	12.6	-	10.0
	Noxon Rapids	334.6	234.3	138.4
	Painted Rocks	31.7	32.2	25.9
	Como	34.9	21.6	19.0

## COLUMBIA

Stream or Stream		Usable Capacity		Usable Storage
		THIS YEAR	LAST YEAR	AVERAGE
Beaverhead	Lima	84.0	74.9	51.5
	Clark Canyon	257.2	183.8	148.9
	Ruby	38.8	36.5	35.0
	Madison	337.5	168.8	212.6
Gallatin	Ennis Lake	41.0	37.2	35.6
	Middle Creek	8.0	4.5	4.5
Missouri	Canyon Ferry	2,043.0	1,514.0	1,552.0
	Hauser & Helena	61.9	63.0	59.3
	Lake Helena	10.4	10.9	9.6
	Holter Lake	81.9	79.6	70.6
	Fort Peck Lake	18,910.0	16,390.0	15,880.0
	Smith River	10.6	-	8.9
	Newlan Creek	12.4	7.3	0.2
Muhseshell	Bair	7.0	-	6.3
	Martinsdale	23.1	-	10.4
	Deadman's Basin	72.2	-	53.0
Sun	Gibson	99.0	48.4	48.8
	Willow Creek	32.2	19.4	23.4
Mariaa	Fishkun	32.0	31.1	23.1
	Lower Two Medicine	11.9	12.5	12.3
	Four Horns	19.2	13.1	9.5
	Swift	30.0	11.7	20.6
	Lake Frances	111.9	42.5	84.6
Milk	Elwell (Tiber)	1,347.0	564.7	611.2
	Beaver Creek	3.5	2.7	2.8
	Fresno	127.2	129.8	106.5
	Nelona	66.8	22.7	45.2

## MISSOURI

Stream or Stream	RESERVOIR	Usable Capacity	Usable Storage	
		THIS YEAR	LAST YEAR	AVERAGE



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U. S. DEPARTMENT OF AGRICULTURE ★ SOIL CONSERVATION SERVICE

# WATER SUPPLY OUTLOOK FOR MONTANA

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS  
Collaborating with

MONTANA AGRICULTURAL EXPERIMENT STATION

AS OF  
MAY 15, 1978



Issued by

R. M. DAVIS  
ADMINISTRATOR  
SOIL CONSERVATION SERVICE  
WASHINGTON, D.C.

Released by

VAN K. HADERLIE  
STATE CONSERVATIONIST  
SOIL CONSERVATION SERVICE  
Bozeman, Montana

In Cooperation with

J. A. ASLESON  
DIRECTOR  
Montana Agricultural Experiment Station

Report prepared by

PHILLIP E. FARNES, Snow Survey Supervisor  
DONALD J. HUFFMAN, Hydrologist  
CINDY L. ONDRAK, Statistical Clerk

SOIL CONSERVATION SERVICE  
P.O. Box 98  
Bozeman, Montana 59715

## COLUMBIA RIVER DRAINAGE

SNOWMELT IN LOWER ELEVATIONS HAS BEEN GRADUAL OVER THE PAST TWO WEEKS. SOME MELT HAS STARTED IN HIGHER ELEVATIONS. MUCH OF THE SNOWMELT AT HIGHER ELEVATIONS HAS BEEN REPLACED BY NEW SNOWFALL. MANY HIGH ELEVATION SNOW PILLOWS SHOW A NET LOSS OF 1 TO 2 INCHES OF SNOW WATER EQUIVALENT IN THE PAST 15 DAYS. MANY LOW ELEVATION SNOW COURSES ARE BARE. THIS IS NORMAL FOR THIS TIME OF YEAR.

STREAMFLOWS ARE EXPECTED TO HOLD UP WELL THIS SPRING IN THE BITTERROOT, BLACKFOOT, CLARK FORK, AND THE SOUTH FORK OF THE FLATHEAD RIVERS. THIS IS A RESULT OF GOOD HIGH ELEVATION SNOWPACK FOR THIS TIME OF THE YEAR.

VOLUME FORECASTS ARE NOT ISSUED AFTER MAY 1, HOWEVER, CLIMATIC CONDITIONS OVER THE PAST TWO WEEKS DO NOT INDICATE ANY SIGNIFICANT CHANGE IN THE MAY 1 FORECASTS.

MOST MAJOR STREAMS IN THE DRAINAGE ARE EXPECTED TO REACH THEIR SNOWMELT PEAK NEAR THE END OF MAY.

SOME STREAMS WITH LOWER ELEVATION HEADWATERS ARE NOW REACHING THEIR SNOWMELT PEAK.



Exposed ridges are now starting to bare-off in high elevation watersheds. Many areas still have 8 to 10 feet of snow in the protected areas.

UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

P.O. Box 98  
Bozeman, Montana 59715

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# SNOW SURVEY DATA

## SNOW

NAME	Elevation	THIS YEAR		PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year
ARLI FALLS	7350	5/16	26	11.2	.0
BALD EAGLE PEAK	5700	5/16	101	49.6	21.1
BANFIELD MOUNTAIN	5600	5/15	22	12.4	.0
BANFIELD MOUNTAIN PILLOW	5600	5/15	SP	10.6	.0
BAEEL CREEK	5500	5/16	61	33.9	7.8
BAEEL MIDWAY	4600	5/16	28	14.8	1.6
BAKEE TRAIL	3000	5/16	0	.0	.0
BASIN CREEK	7180	5/15	14	4.4	-
BAITLE RIDGE	6020	5/15	0	.0	-
BLACK FLAR	7950	5/15	0	44.5	2.0
BLACK BEAR PILLOW	7590	5/15	SP	42.2	2.3
BLACK PINE	7100	5/15	21	10.4	.0
BLACK PINE PILLOW	7100	5/15	SP	10.3	.0
POIS SOTS	8000	5/15	13	4.8	.0
BRIDGE BOWL	7250	5/15	63	32.0	7.9
BRIDGEN BOWL PILLOW	7250	5/15	SP	31.9	6.8
BRISTOW CREEK	5900	5/15	0	.0	.0
CALVERT CREEK PILLOW	6450	5/15	SP	.0	.0
CAMP MISERY	6400	5/17	118	60.4	36.6
CAMP SENIA	7890	5/15	29	9.3	1.1
CARROT BASIN	9000	5/11	96	44.6	15.6
CARROT BASIN PILLOW	9000	5/11	SP	36.4	12.2
CEUDAR GROVL	4100	5/16	0	.0	1.7
COLL CREEK	7850	5/16	41	15.8	2.0
COLE CREEK PILLOW	7850	5/15	SP	14.0	1.4
COMBINATION	5600	5/15	0	.0	.0
COMBINATION PILLOW	5600	5/15	SP	.0	.0
COOKE STATION	8150	5/11	62	28.3	8.0
COPPER BOTTOM	5200	5/15	0	.0	-
COPPLER BOTTOM PILLOW	5200	5/15	SP	.6	.0
COPPER CAMI	6950	5/15	0	30.0	-
COPPER MOUNTAIN	7700	5/15	16	6.9	-
DAVIS CREEK	5400	5/15	22	11.8	.0
DEADMAN CREEK	6450	5/12	10	5.1	.0
DEADMAN CREEK PILLOW	6450	5/12	SP	4.7	.0
DEVILS SLIDE	8100	5/16	63	27.4	15.7
DISCOVERY BASIN	7050	5/15	6	2.7	.0
DIVIDE	7800	5/15	0	9.5	.0
DIVIDE PILLOW	7600	5/15	SP	10.7	1.0
EAST BOULDR S	9250	5/15	90	41.5A	17.0
FISH CREEK	8000	5/15	29	9.1	-
FISHER CREEK	9100	5/11	110	49.2	21.0
FISHER CREEK PILLOW	9100	5/11	SP	44.7	19.2
FOURTH OF JULY	3450	5/17	0	.0	.0
FRIDAY HILL	4620	5/17	1	.6	.0
GARVER CREEK	4250	5/15	0	.0	.0
GAIVL CREEK PILLOW	4250	5/15	SP	.0	.0
GRAVEL CREEK	4300	5/12	16	7.2	.0
GRAVEL CREEK PILLOW	4300	5/12	SP	5.9	.0
HAWKINS LAKE	6450	5/15	61	29.0	7.1
HAWKINS LAKE PILLOW	6450	5/15	SP	27.3	7.5
HEART LAKE TRAIL	4800	5/17	6	2.8	-
HOOD MEADOW	6600	5/15	5	2.4	.0
HOODOO BASIN	6000	5/17	86	43.7	-
HOODOO CREEK	5900	5/17	77	39.2	-
KINGS HILL	7500	5/12	43	18.2	6.9
LEMMI RIDGE	6100	5/15	0	11.5	.0
LEMMI RIDGE PILLOW	8100	5/15	SP	12.3	.0
LICK CREEK	6860	5/15	0	.0	7.0
LICK CREEK PILLOW	6860	5/15	SP	.0	6.0
LOST SOUL	4800	5/15	0	.0	.8
MAYNARD CREEK	6210	5/15	50	14.2	.0
MAYNARD CREEK PILLOW	6210	5/15	SP	11.3	.9
MEKTON MOUNTAIN	5600	5/17	57	27.8	7.0
MINIST BASIN	6040	5/17	110	58.6	35.5
NOISY BASIN PILLOW	6040	5/17	SP	47.0	27.4
NOISY CREEK	3600	5/17	0	.0	-
NORTH FK. ELK CREEK	6250	5/16	3	.8	-
NORTH FK. ILK CREEK PIL	6250	5/16	SP	.4	-
NORTH FORK JOCKO	6350	5/16	82	44.5	20.6
NORTHEAST ENTRANCE	7400	5/11	16	6.8	.0
NORTHEAST ENTRANCE PIL	7400	5/11	SP	6.0	3.7
PETERSON MEADOWS	7200	5/15	14	5.9	.5
PETERSON MEADOWS PILLOW	7200	5/15	SP	8.3	.4
PICKET PIL	9450	5/17	81	35.0A	6.5
PLAICR BASIN F	8800	5/15	66	28.5A	.0
POORMAN CREEK	5100	5/16	40	20.9	.0
POORMAN CREEK PILLOW	5100	5/15	SP	21.9	.5
PEU MOUNTAIN	6000	5/15	28	14.3	.0
PEU TOP	5260	5/17	43	21.4	-
POCKER PEAK	8000	5/15	0	22.0	.0
POCKER PEAK PILLOW	8000	5/15	SP	22.5	5.5
SAUOLE MOUNTAIN	7940	5/15	0	31.0	5.0
SAUOLE MOUNTAIN PILLOW	7940	5/15	SP	31.5	7.2
SHOWER FALLS	8100	5/15	72	32.7	18.3
SHOWER FALLS PILLOW	8100	5/16	SP	31.6	16.3
SILVER RUN	6630	5/15	0	.0	.0
SILVER RUN PILLOW	6630	5/15	SP	.0	.0

Average based on 1958-72 period. A - Aerial observation; water content estimated.  
SP - Snow Pillow observation; water content only.



Aerial markers are observed from small fixed wing aircraft flying over the snowfields. The snow depth is determined by noting the snow line on the crossblades of the marker. The snow depth on this photograph is 73 inches. The snow water equivalent is estimated by using the density from nearby snow courses. There are 13 aerial markers in Montana.

## SNOW

NAME	Elevation	THIS YEAR		PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year
SKALKHAO SUMMIT	7260	5/16	52	25.2	3.0
SKALKHAO SUMMIT PILLOW	7260	5/16	SP	26.9	5.4
SPUR PARK	8000	5/12	68	30.4	10.4
SPUR PARK PILLOW	8100	5/12	SP	30.6	11.7
STAHL PEAK	6050	5/12	100	45.9	18.7
STAHL PEAK PILLOW	6050	5/12	SP	40.7	16.3
STAR LAKE L	9650	5/15	110	55.0A	-
STUART MOUNTAIN	7400	5/17	70	35.1	5.7
TIMBERLINE CREEK	8850	5/15	50	16.5	4.8
TV MOUNTAIN	6800	5/17	34	16.6	1.8
TWIN LAKLS	6510	5/15	0	45.5	13.2
TWIN LAKLS PILLOW	6400	5/15	SP	41.0	11.1
WEASEL DIVIDE	5450	5/12	62	30.4	3.0
WEST YELLOWSTONE PILLOW	6700	5/12	SP	.0	1.9
WHISKEY CREEK	6000	5/12	26	14.4	.0
WHISKEY CREEK PILLOW	6800	5/12	SP	15.5	.0
WHITE HILL	8700	5/11	90	40.0	14.5
WHITE HILL PILLOW	8700	5/11	SP	35.2	11.2

## LATE ARRIVING DATA

Badger Pass	6900	5/18	76	38.8	16.0	-
Blue Lake	5900	5/18	34	17.1	0.0	-
Gunsight Lake	6300	5/18	75	39.3	17.2	-
Hell Roaring Divide	5770	5/17	48	24.5	6.4	26.7
Lookout (ID)	5250	5/15	43	22.5	.4	30.9
Trinkus Lake	6100	5/18	78	43.0	15.0	-
Twin Creeks	3580	5/18	0	0.0	0.0	-

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U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE  
**WATER SUPPLY OUTLOOK  
FOR  
MONTANA**

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS  
Collaborating with

MONTANA AGRICULTURAL EXPERIMENT STATION

AS OF  
**JUNE 1, 1978**



Issued by  
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WASHINGTON, D.C.

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SOIL CONSERVATION SERVICE  
P.O. Box 98  
Bozeman, Montana 59715

UNITED STATES DEPARTMENT OF AGRICULTURE  
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**Montana Water Supply Outlook**

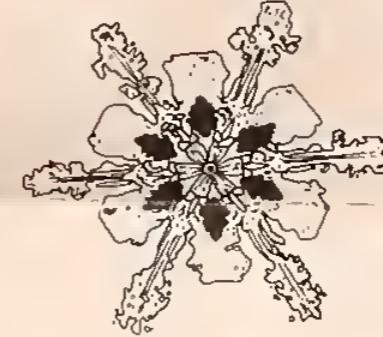
THE MOUNTAIN SNOWPACK IS  
GENERALLY ABOVE AVERAGE IN HIGHER  
ELEVATIONS. SHORT PERIODS OF  
MELT COMBINED WITH LONGER PERIODS  
OF BELOW FREEZING TEMPERATURES  
AND NEW SNOWFALL, HAVE HELPED  
MAINTAIN A GOOD SNOWPACK FOR  
JUNE 1.

MANY AREAS HAVE ABOUT THE  
SAME AMOUNT OF WATER STORED IN  
THE SNOWPACK AS THEY HAD NEAR MAY  
15. THE GOOD SNOWPACK IN THE  
HIGH COUNTRY WILL HELP KEEP  
STREAMFLOWS UP WELL INTO THE SUM-  
MER.

PRECIPITATION IN THE PAST  
TWO WEEKS HAS BEEN GOOD IN MOST  
AREAS WITH HEAVY AMOUNTS IN SOME  
AREAS.

SNOWMELT PEAKS HAVE BEEN DE-  
LAYED BY COOL WEATHER NEAR THE  
END OF MAY.

MOST STREAMS SHOULD HAVE PEAK  
SNOWMELT RUNOFF WITHIN THE NEXT  
THREE TO FOUR WEEKS. THE WATER  
SUPPLY CONDITIONS REMAIN GOOD FOR  
MOST AREAS WITH SOME IMPROVEMENT  
NOTED IN THE PAST 15 DAYS, PAR-  
TICULARLY IN SOUTHERN PORTIONS OF  
THE STATE.



**COLUMBIA RIVER DRAINAGE**

HIGH ELEVATION SNOW COURSES  
HAVE SHOWN BOTH INCREASES AND  
MELT OVER THE PAST 15 DAYS. CUR-  
RENT AMOUNTS OF WATER STORED IN  
THE SNOWPACK ARE GENERALLY ABOVE  
AVERAGE. MOST OF THE SNOW IN  
LOWER ELEVATIONS HAS MELTED.

STREAMS STARTED TO INCREASE  
THEIR FLOWS FROM SNOWMELT ABOUT  
MAY 22-24 AND THEN COOLER WEATHER  
RETARDED MELT.

STREAMS ARE PRESENTLY RISING  
WITH MELT WATER CAUSED BY WARMER  
TEMPERATURES. STREAMS THAT DID  
NOT REACH THEIR SNOWMELT PEAK IN  
LATE MAY SHOULD HAVE THEIR PEAK  
RUNOFF FROM SNOWMELT AROUND JUNE  
7-10. HIGHER ELEVATION WATER-  
SHEDS IN THE BITTERROOT AND FLAT-  
HEAD DRAINAGES MAY PEAK SLIGHTLY  
LATER.

WATER SUPPLY CONDITIONS HAVE  
IMPROVED A LITTLE SINCE MAY 15,  
PARTICULARLY WITH RESPECT TO LATE  
SEASON IRRIGATION SUPPLIES. THE  
ONLY FORECAST ISSUED FOR JUNE 1,  
IS FOR THE BITTERROOT RIVER NEAR  
DARBY, FOR WHICH JUNE THROUGH  
SEPTEMBER RUNOFF IS FORECAST TO  
BE ABOUT 22 PERCENT ABOVE AVERAGE.

**MISSOURI RIVER DRAINAGE**

NEW SNOWFALL KEEPS RAISING  
THE SNOWPACK LEVELS, BUT HAVE  
GENERALLY FOLLOWED SHORT MELT  
PERIODS THAT HAVE REDUCED THE  
AMOUNT OF WATER CONTAINED IN THE  
SNOWPACK. IN SOME AREAS NEW SNOW-  
FALLS HAVE OCCURRED UP TO JUNE 1,  
AND IN GENERAL, THE HIGH ELEVA-  
TION SNOWPACK HAS ABOVE AVERAGE  
WATER CONTENT.

THE WATER SUPPLY CONDITIONS  
HAVE IMPROVED SLIGHTLY IN THE  
PAST TWO WEEKS OVER MOST OF THE  
DRAINAGE. THIS IS PRIMARILY DUE  
TO COOL TEMPERATURES WHICH HAVE  
RETARDED SNOWMELT AND TO NEW SNOW-  
FALLS IN HIGHER ELEVATIONS.

THE COOL WEATHER HAS ALSO  
DELAYED PEAK SNOWMELT RUNOFF. THE  
PEAK INFLOW TO HEGGEN RESERVOIR  
SHOULD OCCUR IN EARLY JUNE, WHILE  
MOST OTHER STREAMS IN SOUTHWESTERN  
HEADWATERS CAN BE EXPECTED TO PEAK  
AROUND MID-JUNE OR A LITTLE LATER.

STREAMS IN CENTRAL MONTANA  
AND NORTHWESTERN PORTIONS OF THE  
DRAINAGE THAT DID NOT REACH THEIR  
PEAK AFTER MID-MAY SHOULD HAVE  
PEAK SNOWMELT RUNOFF IN EARLY JUNE.

**YELLOWSTONE RIVER DRAINAGE**

HIGH ELEVATIONS SHOW SIGNI-  
FICANT INCREASES IN WATER CONTENT  
BETWEEN PERIODS OF MELT. THE  
LOSS OF WATER FROM THE HIGH ELE-  
VATION SNOWPACK HAS BEEN QUITE  
SMALL OVER THE PAST TWO WEEKS.

SOME ADDITIONAL SNOW READ-  
INGS TAKEN IN THE BEARTOOTH  
MOUNTAINS NEAR GOOSE LAKE, NORTH  
OF COOKE CITY, SHOW SNOW DEPTHS  
OF 130 INCHES AND NEARLY 70  
INCHES OF WATER CONTENT. MELT  
FROM THIS SNOW WILL PROVIDE FLOW  
IN THE YELLOWSTONE RIVER AND IT'S  
TRIBUTARIES WELL INTO THE SUMMER.

THE WATER SUPPLY OUTLOOK  
HAS IMPROVED SLIGHTLY OVER THE  
PAST TWO WEEKS. THE DRAINAGE  
ABOVE COONEY RESERVOIR, THAT HAS  
HAD A DEFICIENT SNOWPACK ALL WIN-  
TER, HAS RECEIVED GOOD SNOW AND  
RAINFALL IN THE LAST TWO WEEKS.  
THE LARGEST SNOW WATER CONTENT OF  
THE SEASON AT THE COOKE CREEK SNOW  
COURSE OCCURRED AROUND MAY 20.

MOST STREAMS HAVING HIGH  
ELEVATION HEADWATERS SHOULD REACH  
THEIR SNOWMELT PEAK NEAR OR SOON  
AFTER MID-JUNE. ROCK CREEK COULD  
PEAK APPROXIMATELY A WEEK AFTER  
MID-JUNE.



Many streams are flowing nearly bank-full with snowmelt water. Here, a Parshall flume is used to measure the amount of water flowing past the streamgage station. A recorder is used to maintain a continuous record of the depth of water in the flume.

# SNOW SURVEY DATA

## SNOW

NAME	Elevation	THIS YEAR		PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year
ARCH FALLS	7350	5/31	28	11.0	0.0
BAUGER PASS	6900	5/31	90	37.8	12.1
BLACK EAGLE PEAK	5700	5/31	84	43.4	-
BANFIELD MOUNTAIN	5600	5/31	8	4.4	0.0
BANFIELD MOUNTAIN PILLOW	5600	6/01	SP	1.7	0.0
BASIN CREEK	7180	5/30	7	2.4	-
BAITLE RIDGE	6020	6/01	0	0.0	-
PIG COULLE	5100	5/25	0	0.0	-
BIG CREEK	6750	6/02	107	58.2	26.9
BIG SKY	7700	5/29	10	4.5	-
BLACK BEAR	7950	6/01	0*	36.0	3.4
BLACK BEAR PILLOW	7590	6/01	SP	33.5	0.0
BLACK PINE	7100	5/30	12	5.4	0.0
BLACK PINE PILLOW	7100	6/02	SP	9.9	0.0
BLUE LAKE	5900	5/30	32	11.6	0.0
BRIDGER BOWL	7250	5/31	54	26.8	5.5
BRIDGER BOWL PILLOW	7250	5/31	SP	25.5	2.9
BRIISTON CREEK	5900	5/30	0	0.0	-
CALVURT CREEK	6450	6/01	0*	0.0	-
CAULVERT CREEK PILLOW	6450	6/01	SP	0.0	-
CAMP MISERY	6400	6/01	116	52.6	32.0
CEHAK GROVE	4100	5/31	0	0.0	-
COLE CREEK	7850	6/02	47	18.4	0.0
COLL CREEK PILLOW	7850	6/02	SP	19.6	0.0
COMBINATION	5600	5/30	0	0.0	-
COMBINATION PILLOW	5600	5/30	SP	0.0	-
COOKE STATION	8150	5/30	41	22.1	0.0
COPPER BOTTOM	5200	6/01	0*	0.0	-
COPPER BOTTOM PILLOW	5200	6/01	SP	0.0	-
COPPER CAMP	6950	6/01	0*	2.4	0.0
DAVIS CREEK	5400	5/30	0	0.0	-
DEADMAN CREEK	6450	6/01	0*	0.0	0.0
DEADMAN CREEK PILLOW	6450	6/01	SP	0.0	0.0
DEVILS SLIDE	8100	5/31	69	30.2	11.8
DIVIDE	7800	6/01	0*	0.0	-
DIVIDE PILLOW	7800	6/01	SP	0.0	-
FATTY CREEK	5500	6/02	27	14.5	2.2
FISH CREEK	8000	5/30	29	10.1	2.2
FISHER CREEK	9100	5/30	92	46.9	23.0
FISHER CREEK PILLOW	9100	5/30	SP	41.2	20.2
FOURTH OF JULY	3450	5/30	0	0.0	-
FRIDAY HILL	4620	5/30	0	0.0	-
FROHNER MEADOWS	6480	5/30	0	0.0	-
FROHNER MEADOWS PILLOW	6480	5/30	SP	0.0	-
GARVER CREEK	4250	5/30	0	0.0	-
GARVER CREEK PILLOW	4250	6/01	SP	0.0	-
GIBRONS PASS	7100	5/31	36	18.6	0.0
GRAVE CREEK	4300	5/25	0	0.0	1.6
GRAVEL CREEK PILLOW	4300	5/25	SP	0.0	-
GUNSLIGHT LAKE	6300	5/31	75	37.3	11.6
HANKINS LAKE	6450	5/30	51	25.9	0.8
HANKINS LAKE PILLOW	6450	6/01	SP	22.4	1.0
HELL ROARING DIVIDE	5770	6/01	36	19.4	0.0
HIGHWOOD DIVIDE	5650	5/25	0	0.0	-
HIGHWOOD STATION	4600	5/25	0	0.0	-
HOOD PLAIN	6600	5/31	1	0.2	0.0
HOODOO HASIN	6000	5/31	75	39.2	2.5
HOODOO CREEK	5900	5/31	74	36.9	0.0
HINGS HILL	7500	5/31	35	12.8	0.0
LAKL CREEK	6100	6/01	0	0.0	-

Average based on 1958-72 period. A - Aerial observation; water content estimated.

SP - Snow Pillow observation; water content only.

\* Data estimated from SNOTEL



## SNOW PILLOW RECORDS

## SNOW

NAME	Elevation	THIS YEAR		PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Last Year
LEMHI RIDGE	8100	6/01	0*	5.5	-
LEMHI RIDGE PILLOW	8100	6/01	SP	6.0	0.0
LICK CREEK	6860	5/31	0	0.0	0.4
LICK CREEK PILLOW	6850	5/31	SP	0.1	0.0
LOOKOUT (10)	5250	5/30	29	14.0	0.0
LOST SOUL	4800	5/30	0	0.0	15.0
MAYNARD CREEK	6210	5/31	10	4.1	0.0
MAYNARD CREEK PILLOW	6210	5/31	SP	3.9	0.0
NEWTON MOUNTAIN	5600	5/30	46	24.0	-
NOISY BASIN	6040	6/01	106	51.4	30.4
NOISY BASIN PILLOW	6040	6/01	SP	45.6	19.8
NOISY CREEK	5600	6/01	0	0.0	-
NORTH F. ELK CREEK	6250	6/02	0	0.0	-
NORTH FORK JOCKO	6330	5/31	74	41.1	12.0
NORTHEAST ENTRANCE	7400	5/30	1	0.4	0.2
NORTHEAST ENTRANCE PILL.	7400	5/30	SP	0.0	0.0
OPHIR PARK	7150	5/31	33	15.6	-
PETERSON MEADOWS	7200	5/30	19	5.6	0.0
PETERSON MEADOWS PILLOW	7200	5/30	SP	7.5	0.0
POURMAN CREEK	5100	5/31	16	9.1	0.0
POURMAN CREEK PILLOW	5100	6/01	SP	10.3	0.0
POUPINE	6500	6/01	0	0.0	-
POUPINE PILLOW	6500	6/01	SP	0.0	0.0
REED MOUNTAIN	6000	6/01	16	7.8	-
REED TOP	5260	5/30	29	14.2	-
ROCKER PEAK	6000	5/30	36	15.8	9.2
ROCKER PEAK PILLOW	6000	5/30	SP	20.1	3.0
ROCKY BOY	4700	5/27	0	0.0	-
ROCKY BOY PILLOW	4700	5/27	SP	0.0	0.0
SADDLE MOUNTAIN	7940	5/31	60	29.8	5.8
SADDLE MOUNTAIN PILLOW	7940	5/31	SP	29.7	6.7
SHOWER FALLS	8100	5/31	78	34.3	13.0
SHOWER FALLS PILLOW	8100	5/31	SP	33.4	24.3
SILVER RUN	6630	6/01	0	0.0	-
SILVER RUN PILLOW	6630	6/01	SP	0.0	-
SKALKAHO SUMMIT	7260	5/26	46	23.6	4.4
SKALKAHO SUMMIT PILLOW	7260	5/26	SP	26.6	1.7
SPUR PARK	8000	6/01	0*	24.5	7.2
SPUR PARK PILLOW	8100	6/01	SP	24.1	8.3
STAHL PEAK	6050	5/25	93	44.8	13.0
STAHL PEAK PILLOW	6050	5/25	SP	39.9	11.3
STAR LAKE E.	9650	5/30	109	56.9	-
STUART MOUNTAIN	7400	6/01	58	30.0	3.7
TEPEE CREEK	8000	6/01	31	14.0	0.0
TEPEE CREEK PILLOW	8000	6/01	SP	9.4	0.0
TRINKUS LAKE	6100	5/31	67	36.5	10.4
TV MOUNTAIN	5800	6/01	32	13.9	1.8
TWELVEMILE CREEK	5600	5/30	0	0.0	0.6
TWELVEMILE CREEK PILLOW	5600	5/30	SP	0.0	0.0
TWIN LAKES	6510	6/01	0*	40.0	9.2
TWIN LAKES PILLOW	6400	6/01	SP	38.6	3.4
UPPER HOLLAND LAKE	6200	5/31	58	28.8	0.9
WARM SPRINGS	8250	6/01	54	23.0	-
WARM SPRINGS PILLOW	8250	6/01	0	32.8	-
WEASEL DIVIDE	5450	5/25	48	25.7	0.0
WEST YELLOWSTONE PILLOW	6700	6/01	SP	0.0	0.0
WHISKEY CREEK	6800	6/01	0*	2.5	0.0
WHISKEY CREEK PILLOW	6800	6/01	SP	2.3	0.0
WHITE MILL	8700	5/30	74	38.4	11.8
WHITE MILL PILLOW	8700	5/30	SP	28.5	4.3

# SNOW SURVEY DATA

## CORRECTIONS TO PREVIOUSLY PUBLISHED DATA

Many of the snow survey measurements published in the Water Supply Outlook have been telephoned into the Snow Survey Office. Sometimes, the original notes are not received in time to check additions and subtractions. Also, some surveys are made too

late for the information to be published.

This table shows the corrected data for 1978 snow surveys. The underlined value is the corrected data.

### SNOW

DRAINAGE BASIN and/or SNOW COURSE NAME	Elevation	THIS YEAR		PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)
		Last Year	Average	Last Year	Average

### JANUARY

Chessman Reservoir	6200	1/03	16	3.0	1.3	1.3
Holbrook	4530	12/26	40	7.5A	4.0	4.3
Ten Mile Middle	6800	12/30	33	7.2	2.0	4.9

### FEBRUARY

Northeast Entrance	7400	2/02	41	10.6	4.1	6.6
Twenty-One Mile	7150	1/27	52	15.8	4.4	12.7

### MARCH

Copper Bottom	5200	3/02	42	11.3	6.8	11.1
Copper Camp	6950	3/02	B3	30.4	9.6	30.3
Copper Creek	5700	3/02	50	14.9	4.7	15.4
Copper Lake Creek	6100	3/02	74	25.2	7.4	22.6
Emery Creek	4350	2/28	44	14.9	7.6	-
Hebgen Dam	6550	3/01	54	18.8	5.9	10.8
Kings Hill	7500	2/28	53	16.0	7.6	12.5
Shower Falls	8100	2/27	72	23.9	14.7	21.6
Ten Mile Lower	6600	2/25	30	7.4	1.9	6.9
Thumb Divide (WY)	7900	2/28	62	20.3	3.3	19.0
TV Mountain	6800	2/28	63	19.3	5.5	17.0

### APRIL

Chessman Reservoir	6200	3/29	11	3.4	3.2	3.3
Cottonwood Creek	6400	4/03	23	7.0	6.5	-
Darkhorse Lake	8600	3/28	80	32.5	13.6	28.0
Fred Burr Pass	8000	3/29	65	26.0	15.9	28.2
Hebgen Dam	6550	3/28	39	17.2	7.8	11.6
Kishenehn	3890	3/29	19	5.6	2.8	8.4
Lubrecht Hydroplot	4200	3/29	1	.3	1.6	3.2
Stemple Pass	6600	3/28	33	11.8	8.8	11.4
Ten Mile Middle	6800	3/27	37	12.6	7.6	12.6
Trinkus Lake	6100	4/03	93	44.0	38.3	46.5
TV Mountain	6800	3/30	51	20.9	11.5	20.3

### MAY 1

Badger Pass	6900	5/03	74	38.9	20.2	46.2
Barree Creek	5500	5/01	71	38.0	18.7	49.6
Big Snowy	7150	5/02	66	30.5	25.0	24.9
Blue Lake	5900	5/03	39	19.6	5.8	26.5
Calvert Creek	6450	4/26	23	11.5	.0	9.2
Cole Creek	7850	4/28	30	9.2	15.5	-
Coyote Hill	4200	4/26	25	11.1	12.9	16.2
Fourth of July	3450	4/27	14	5.2	.0	-
Freight Creek	6000	5/03	30	13.4	.0	15.9
Friday Hill	4620	4/27	26	12.8	.0	-
Newton Mountain	5600	4/27	79	36.4	12.9	-
Picket Pin 0	9450	5/04	63	26.5A	9.5	-
Placer Basin F	8800	5/04	51	21.5A	11.0	-
Red Top	5260	4/26	65	29.5	-	-
Rock Creek	5600	5/02	14	6.2	10.4	10.4
Ten Mile Lower	6600	4/27	4	1.4	.0	6.0
Upper Holland Lake	6200	5/03	75	35.9	13.2	41.1

### MAY 15

Blue Lake	5900	5/18	34	17.6	.0	-
Gunsight Lake	6300	5/18	75	39.5	17.2	-
Trinkus Lake	6100	5/18	78	42.8	15.0	-
Upper Holland Lake	6200	5/18	58	30.2	7.3	-

Average based on 1958-72 period. A - Aerial observation; water content estimated.

SP - Snow Pillow observation; water content only.



Even though most valley areas have lost their winter's snowpack, many high elevations continue to have a substantial snow cover on the ground. The melting of this snowpack provides Montana with one of its most valuable resources -- water. Some high elevation areas may be snow-free for only a month or two before a new blanket of snow starts to accumulate.

### RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH

Basin or Stream	RESERVOIR	Usable Capacity	Usable Storage		
			This Year	Last Year	Average
<b>COLUMBIA</b>					
Kootenai	Koocanusa	5,694.0	3,206.0	2,291.0	-
Flathead	Hungry Horse	3,428.0	2,580.0	2,267.0	2,639.0
	Flathead Lake	1,791.0	1,473.0	B67.B	1,4B1.0
	Camas (4)	45.2	17.2	17.6	36.3
	Mission Valley (B)	100.3	94.8	67.2	63.7
Clark Fork	Georgetown Lake	31.0	27.5	29.0	25.6
	Lower Willow Creek	4.9	-	-	4.1
	Nevada Creek	12.6	-	8.1	12.1
	Noxon Rapids	334.6	266.3	314.2	243.9
Bitterroot	Painted Rocks	31.7	33.0	14.2	32.4
	Como	34.9	-	16.4	29.1

### MISSOURI

Beaverhead	Lima	84.0	70.6	65.6	60.2
	Clark Canyon	257.2	182.7	179.6	149.5
Ruby	Ruby	38.8	-	38.8	37.7
Madison	Hebgen Lake	337.5	226.1	270.9	287.1
	Ennis Lake	41.0	37.1	35.6	36.9
Callatin	Middle Creek	8.0	7.2	6.7	7.0
Missouri	Canyon Ferry	2,043.0	1,704.0	1,737.0	1,652.0
	Hauser & Helena	61.9	63.0	60.5	57.9
	Lake Helena	10.4	10.9	10.7	9.1
	Holter Lake	81.9	74.7	81.	

## SOIL MOISTURE READINGS DISCONTINUED

The Soil Conservation Service has discontinued readings at soil moisture stations in Montana.

With present restrictions on staff and funding and the move toward more automation, we cannot continue with this program.

All data gathered on soil moisture and temperature will be published in the near future.

Soil moisture readings were initiated in 1956. These stations were located primarily in the foothills and mid-elevations of mountain drainages. Most sites had five moisture and temperature units buried at depths of 3, 10, 19, 30, and 42 inches,

to represent a four foot profile.

Since upper layer conditions change more rapidly, the units were spaced closer together in the upper reaches. There were 24 active soil moisture stations at the time they were discontinued.

The stations were installed primarily to improve the accuracy of water supply forecasts. However, the trend toward near-real-time data, the use of other variables to represent watershed soil moisture, and the availability of staff and funds for only high priority programs has made it impractical for the Snow Survey Unit to continue these soil moisture readings.



A watershed soil moisture station.

## SOIL MOISTURE as of May 15, 1978

DRAINAGE BASIN and/or STATION	Profile (Inches)			Date of Survey	Soil Moisture (Inches)		
	Name	Elevation	Depth		This Year	Last Year	Average +

### COLUMBIA RIVER DRAINAGE

<u>Clark Fork</u>							
Black Pine	7100	48	10.0	5/15	8.4	8.8	*
Skalkaho Summit	7260	48	10.8	4/29	10.2	9.3	9.9

### MISSOURI RIVER DRAINAGE

<u>Gallatin</u>							
Bridger Bowl	7250	48	17.0	4/26	14.8	16.1	16.0
College Site No. 2	4856	54	17.7	5/12	16.0	13.5	*
Lick Creek	6860	48	18.8	5/15	14.0	14.6	*
<u>Missouri Main Stem</u>							
Kings Hill	7420	48	11.8	5/12	10.6	10.7	*
Stemple Pass	6350	48	5.9	5/5	5.3	5.4	5.0

### YELLOWSTONE RIVER DRAINAGE

<u>Shields</u>							
Battle Ridge	6020	48	17.6	5/15	14.6	13.0	*
<u>Upper Yellowstone</u>							
Northeast Entrance	7360	48	9.4	5/11	11.0	-	-

+ Average for period of record.

## SOIL MOISTURE as of June 1, 1978

DRAINAGE BASIN and/or STATION	Profile (Inches)			Date of Survey	Soil Moisture (Inches)		
	Name	Elevation	Depth		This Year	Last Year	Average +

### COLUMBIA RIVER DRAINAGE

<u>Kootenai</u>							
Baree Trail	3800	48	7.5	-	-	6.4	6.2
Murphy Lake R. S.	3000	48	22.6	6/1	22.5	19.4	20.5
Raven	3050	48	23.0	-	-	14.1	16.4
<u>Flathead</u>							
Desert Mountain	5600	54	B.4	6/5	8.6	7.8	B.8
Marias Pass	5250	54	6.5	5/27	B.6	7.4	6.3
<u>Clark Fork</u>							
Black Pine	7100	48	10.0	5/30	8.4	8.8	8.7
Lubrecht Forest	4100	48	26.8	-	-	15.5	21.9
Seeley Lake R. S.	4030	48	11.9	-	-	8.8	10.7
Skalkaho Summit	7260	48	10.8	5/26	9.9	10.4	10.0
<u>Bitterroot</u>							
Gibbons Pass	7100	48	7.1	5/31	6.6	6.1	6.9
Lolo Pass	5250	48	10.6	6/2	10.2	10.0	9.9

### MISSOURI RIVER DRAINAGE

<u>Beaverhead</u>							
Lakeview	6700	48	15.3	5/31	16.1	17.6	15.2
<u>Madison</u>							
West Yellowstone	6700	48	6.5	6/1	2.8	2.8	3.0
<u>Gallatin</u>							
Bridger Bowl	7250	48	17.0	5/31	14.7	15.8	16.0
College Site No. 2	4856	54	17.7	5/26	15.8	16.2	14.4
Lick Creek	6860	48	18.8	5/31	13.9	15.0	17.2
Twenty-One Mile	7150	48	10.0	6/1	9.7	8.6	9.8
<u>Missouri Main Stem</u>							
Kings Hill	7420	48	11.8	5/31	10.8	9.9	10.6
Stemple Pass	6350	48	5.9	5/31	5.3	-	5.2
<u>Milk</u>							
Beaver Creek	3950	48	20.9	5/27	16.9	17.9	15.0
Rocky Boy	4700	36	10.1	5/27	9.6	9.1	9.6

### YELLOWSTONE RIVER DRAINAGE

<u>Shields</u>							
Battle Ridge	6020	48	17.6	5/31	16.4	13.1	14.6
<u>Upper Yellowstone</u>							
Northeast Entrance	7360	48	9.4	5/30	9.3	-	9.3

+ Average for period of record.

## NOTE!!! Dedication of Snow Surveyors

We received a telephone call soon after our copy was submitted for press that snow surveyors had walked 8 miles through mud and snow and developed significant blisters to obtain the snow readings. We felt obligated to stop the presses long enough to include these snow readings in the report.

The Stryker Basin snow course, northwest of Kalispell, showed 46 inches of snow depth with 27.4 inches of water content. Last year there was 8.0 inches of water content. Herrig Junction and Chicken Creek both had no snow. These snow courses are measured by the State Forester's Office on the Stillwater State Forest.

Water, much of which originates from melting snow, is used for many things including irrigation of agricultural crops. The water supply outlook for this irrigation season looks good for most areas in Montana.

